

**REMARKS**

Claims 11 to 19 were rejected under 35 U.S.C. 103(a) as being unpatentable as anticipated by Schwaiger (DE 3625590). Claims 11 to 17 and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable as anticipated by Meintschel et al. (DE 10204122). Claim 18 was rejected under 35 U.S.C. 103(a) as being unpatentable as obvious over Meintschel et al. in view of Heimann et al. (U.S. Patent 5,823,158).

Claim 11 is hereby amended, claim 18 is canceled and new claims 20 to 23 are added. Support is found at paragraphs [0021] to [0023] and [0029], for example.

Reconsideration of the application in view of the amendments and the following remarks is respectfully requested.

**35 U.S.C. 102(b) Rejections: Schwaiger**

Claims 11 to 19 were rejected under 35 U.S.C. 103(a) as being anticipated by Schwaiger (DE 3625590).

Schwaiger discloses exhaust valves that are described as being able to withstand high working temperatures. (See English abstract of Schwaiger).

Claim 11 recites “[a] lightweight valve comprising:  
a valve stem;  
a hollow valve cone with a hollow space having an end of greater diameter; and  
a valve disk closing the hollow space on one side and having a flat side facing the valve cone;  
the valve stem being connected to a stem connection element formed on or fastened to the valve disk;  
a valve cone support located at a distance from the valve disk and provided in the hollow space, the valve cone support being located on the stem connection element and projecting above the flat side; and  
the valve disk having a recess serving as a centering or supporting seat for receiving the end of greater diameter of the valve cone, the valve disk including a step extending upward from the flat side of the valve disk so as to define an inner circumference of the recess, the step supporting an inner circumference of the end of greater diameter of the valve cone.” Claims 12

to 19 are dependent on claim 11.

It is respectfully submitted that Schwaiger does not disclose a lightweight valve with “the valve disk having a recess serving as a centering or supporting seat for receiving the end of greater diameter of the valve cone, the valve disk including a step extending upward from the flat side of the valve disk so as to define an inner circumference of the recess, the step supporting an inner circumference of the end of greater diameter of the valve cone” as required by claim 11. (emphasis added). None of the embodiments disclosed in Schwaiger include the “recess” and “step” required by claim 11.

Withdrawal of the rejection under 35 U.S.C. 102(b) of claims 11 to 19 is respectfully requested.

35 U.S.C. 102(b) Rejections: Meintschel et al.

Claims 11 to 17 and 19 were rejected under 35 U.S.C. 103(a) as being anticipated by Meintschel et al. (DE 10204122).

Meintschel et al. discloses:

[a] valve (1) for a reciprocating piston machine comprises a valve shaft (2) and a separately constructed valve disk (3) having a central opening (4) receiving the disk-side end of the valve shaft. An undercut expansion (5) with rounded transitions extending in the peripheral direction and remaining within the central opening is provided in the valve disk. An enlarged area (6) of the disk-side end of the valve shaft engages in the undercut expansion so that the undercut expansion axially protrudes over the enlarged area to axially clamp the enlarged area and produce a form-locking connection loaded in the pressure and tension direction and secured against tilting.

(See English abstract of Meintschel et al.).

Claim 11 recites “[a] lightweight valve comprising:

a valve stem;

a hollow valve cone with a hollow space having an end of greater diameter; and

a valve disk closing the hollow space on one side and having a flat side facing the valve cone;

the valve stem being connected to a stem connection element formed on or fastened to

the valve disk;

a valve cone support located at a distance from the valve disk and provided in the hollow space, the valve cone support being located on the stem connection element and projecting above the flat side; and

the valve disk having a recess serving as a centering or supporting seat for receiving the end of greater diameter of the valve cone, the valve disk including a step extending upward from the flat side of the valve disk so as to define an inner circumference of the recess, the step supporting an inner circumference of the end of greater diameter of the valve cone.” Claims 12 to 17 and 19 are dependent on claim 11.

It is respectfully submitted that Meintschel et al. does not disclose a lightweight valve with “the valve disk having a recess serving as a centering or supporting seat for the valve cone by receiving the end of greater diameter of the valve cone, the valve disk including a step extending upward from the flat side of the valve disk so as to define an inner circumference of the recess, the step supporting an inner circumference of the end of greater diameter of the valve cone” as required by claim 11. (emphasis added). Disc shaped plate 28 of Meintschel et al. in no way includes the “recess” or “step” required by claim 11.

Withdrawal of the rejection under 35 U.S.C. 102(b) of claims 11 to 17 and 19 is respectfully requested.

### 35 U.S.C. 103(a) Rejection

Claim 18 was rejected under 35 U.S.C. 103(a) as being unpatentable over Meintschel et al. in view of Heimann et al. (U.S. Patent 5,823,158). Claim 18 is hereby canceled; however, claim 11 now includes limitations that are similar to the limitations of canceled claim 18.

Meinschel et al. is described above. Heimann et al. discloses in Fig. 6 an engine valve 200 having a cap member 160 that includes:

first and second annular surfaces 202 and 204, respectively, and an axial surface 206 facing into the flared chamber portion 110 of the body member 100. The first annular surface 202 extends radially and connects the conical inner surface 162 with the axial surface 206. The second annular surface 204 extends axially and connects the conical outer surface 164 with the third conical surface 170. The first annular surface 202 and the axial surface 206 together define an annular recess 208 for receiving the flared first

end portion 102 of the body member 100. The perimeter surface 116 in the flared first end portion 102 of the body member 100 abuts the axial surface 206 in the cap member 160 and the two parts are then welded together, preferably by laser welding. The abutting surfaces 116 and 206 of the body member 100 and the cap member 160, respectively, provide additional strength to the weld joining the body member and the cap member.

(Heimann et al., col. 6, lines 24 to 40).

It is respectfully submitted that neither Meinschel et al. nor Heimann et al., alone or in combination, discloses “the valve disk having a recess serving as a centering or supporting seat for receiving the end of greater diameter of the valve cone, the valve disk including a step extending upward from the flat side of the valve disk so as to define an inner circumference of the recess, the step supporting an inner circumference of the end of greater diameter of the valve cone” as required by claim 11. (emphasis added). As discussed above, disc shaped plate 28 of Meintschel et al. in no way includes the “recess” or “step” required by claim 11. Heimann et al. also does not cure this deficiency of Meinschel et al. because cap member 160 of Heimann et al. does not include any “step” that defines an inner circumference of a recess and is capable of “supporting an inner circumference of the end of greater diameter of the valve cone.” Thus, because no possible combination of the references discloses the “recess” or “step” required by claim 11, claim 11 is not unpatentable as obvious in view of Meinschel et al. and Heimann et al.

Withdrawal of the rejection under 35 U.S.C. 103(a) is respectfully requested.

**Conclusion**

It is respectfully submitted that the present application is now in condition for allowance,  
and Applicants respectfully requests such action.

Respectfully submitted,  
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